REMARKS

Currently, claims 2-4, 7, 8, 10-13, 15-17, 19, 21, and 22 are pending in the present application, including independent claim 21 and withdrawn claims 15-17. For instance, independent claim 21 is directed to a composite that includes a polyacetal component and a thermoplastic polyamide elastomer component. More specifically, the thermoplastic polyamide elastomer component is directly molded onto the polyacetal component.

The polyacetal component includes polyacetal and at least one modifier selected from the group consisting of thermoplastic polyurethane elastomer, methyl methacrylate-butadiene-styrene core-shell elastomer, methyl methacrylate-acrylate core-shell elastomer, polycarbonate, styrene-acrylonitrile copolymer, and acrylate-styrene-acrylonitrile copolymer compounded material. The thermoplastic polyamide elastomer component consists essentially of at least one thermoplastic polyamide elastomer. The thermoplastic polyamide elastomer is a copolyamide consisting of the repeat structural units of the formulae I and II or of the formulae I and III or of the formulae I, II, and III, which have been linked to one another via ester bonds and/or amide bonds

$$-[O\text{-}R^1\text{-}O\text{-}[CO\text{-}R^2\text{-}[CO]_q]_m]_n- \quad (I),$$

$$-OC\text{-}R^4\text{-}OC\text{-}[NH\text{-}R^3\text{-}NH\text{-}CO\text{-}R^4\text{-}CO]_o- \quad (II),$$

$$[-NH\text{-}R^5\text{-}CO]_p- \quad (III),$$

where R^1, R^2, and R^3, independently of one another, are alkylene or cycloalkylene radicals,

where R^4 and R^5, independently of one another, are alkylene, cycloalkylene, or arylene radicals,

m and q, independently of one another, are 0 or 1, and

n, o, and p, independently of one another, are whole numbers at least equal to 1.

The polyacetal component and the thermoplastic polyamide elastomer component have been bonded adhesively or cohesively to one another via the process as outlined in the claim. The tensile bond strength between the two components is at least 0.5 N/mm^2.

In the Office Action, claims 2-4, 7-8, 10-13, 19, and 21-22 were rejected under 35 U.S.C. §112, first paragraph. With no comment as to the appropriateness of the rejection, independent claim 21 has been amended in accord with the Examiner's suggestion.

In the Office Action, independent claim 21 was rejected under 35 U.S.C. §103(a) as being unpatentable over Flexman, et al. (U.S. Published Patent Application No. 2004/0121175) in view of Tanaka, et al. (U.S. Patent No. 4,376,856).

Applicants respectfully submit that the cited references, taken either alone or in any proper combination, fail to disclose or suggest elements of claim 21. For instance, the combined references fail to disclose or suggest a a thermoplastic polyamide elastomer as is found in independent claim 21.

Tanaka, et al. discloses a segmented polyether-ester amide and process for the preparation thereof (col. 1, ll. 7-9). Specifically, the polyether-ester polyamide is obtained by mixing an aminocarboxylic acid (A) having 6 to 20 carbon atoms, a poly(alkylene oxide) glycol (B) having a number average molecular weight of 300 to

6,000, and a dicarboxylic acid (C) having 4 to 20 carbon atoms at such a mixing ratio that the amount of component (B) is 5 to 90% by weight (col. 1, ll. 60-68). Accordingly, the formed terpolymer will include three distinct blocks, the first block formed of the polymerized aminocarboxylic acid, and providing a block including a series of amide groups to the formed polymer; the second block formed of the polymerized poly(alkylene oxide) glycol, and providing a block including a series of ether groups to the formed polymer; and the third block formed of the dicarboxylic acid, and providing a block including a series of ester groups to the formed polymer.

In contrast, the thermoplastic polyamide elastomer component of the composites of independent claim 21 consists of the repeat structural units of the formulae I and II or of the formulae I and III or of the formulae I, II, and III, which have been linked to one another via ester bonds and/or amide bonds

$$-[O\text{-}R^1\text{-}O\text{-}[CO\text{-}R^2\text{-}[CO]_q]_m]_n- \quad (I),$$

$$-OC\text{-}R^4\text{-}OC\text{-}[NH\text{-}R^3\text{-}NH\text{-}CO\text{-}R^4\text{-}CO]_o- \quad (II),$$

$$[-NH\text{-}R^5\text{-}CO]_p- \quad (III),$$

where R^1, R^2, and R^3, independently of one another, are alkylene or cycloalkylene radicals,

where R^4 and R^5, independently of one another, are alkylene, cycloalkylene, or arylene radicals,

m and q, independently of one another, are 0 or 1, and

n, o, and p, independently of one another, are whole numbers at least equal to 1.

The polymer formed to include the repeat structural units of the formulae I and II or of the formulae I and III or of the formulae I, II, and III will have block(s) including a

series of amide bonds provided from the formula II and/or formula III component. However, the polymer will not have two additional blocks, one providing a series of ester bonds and the other providing a series of ether blocks. In an embodiment in which the formed polymer can include both ester bonds and ether bonds (for instance if q is 0 and m is 1 in formula I), the ester groups and ether groups will be provided on the same block. The polymer will not include a block providing a series of ether groups and another, separate block providing a series of ester groups, as is found in the polymer of Tanaka, et al.

Accordingly, Applicants respectfully submit that, even if combined together, as was suggested in the Office Action (though Applicants do not admit proper rationale for such a combination exists), the combined references would still fail to disclose the composite of independent claim 21.

Moreover, Applicants further submit that the combined references fail to disclose or suggest a composite including a thermoplastic polyamide elastomer component directly molded onto a polyacetal component in which the tensile bond strength between the polyacetal component and the thermoplastic polyamide elastomer component is at least 0.5 N/mm^2 as is found in independent claim 21.

The composite of claim 21 is provided in a product-by-process format. The Examiner has taken the position that a final composite structure taught by Flexman, et al. combined with Tanaka, et al. would be indistinguishable from the final product of the present claims, as both describe a layer of POM adhesively bonded to a polyamide elastomer. Applicants respectfully disagree.

The claimed composite describes a tensile bond strength between the polyacetal component and the thermoplastic polyamide elastomer component that is at least 0.5 N/mm^2. Neither Flexman, et al. nor Tanaka, et al. disclose or suggest the claimed tensile bond strength between a polyacetal and a second thermoplastic polyamide elastomer component. It appears that the Examiner is assuming that the claimed tensile bond strength would be an inherent characteristic of a composite formed according to a combination of Flexman, et al. and Tanaka, et al. However, inherency may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. To establish inherency, the evidence must make clear that the missing descriptive matter is *necessarily present* in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. The mere fact that a certain thing *may* occur or be present in the reference is not sufficient.

According to independent claim 21, prior to the molding-on of the thermoplastic polyamide elastomer component, the polyacetal molding is preheated to a temperature in the range from 80°C to just below its melting point. Flexman, et al., which discloses the formation of polyacetal/polymer composites, does not disclose or suggest such a formation step. As described in the captioned application, with respect to the adhesion subsequently achievable, it is particularly advantageous for the polyacetal molding first injection molded to be preheated to a temperature in the range from 80°C to just below the melting point. This facilitates incipient melting of the surface via the thermoplastic polyamide elastomer injected onto the material and penetration of this elastomer into the interface layer (p. 13, ll. 10-24 of the captioned application).

As taught in the captioned application, the process step of preheating the polyacetal molding to a temperature in the range from 80°C to just below its melting point prior to the molding-on of the thermoplastic polyamide elastomer component, which is cited in independent claim 21, can facilitate the adhesion of the two materials to one another. One would expect then, that this process step would lead to improved bonding characteristics, such as an improvement in tensile bonding strength. This process step is neither disclosed nor suggested by the cited references.

Applicants respectfully submit that particularly as the claimed process steps utilized to form the claimed composite materials differ from those of the cited references, the suggestion that the products formed by cited references would inherently describe the same characteristics as the claimed products is erroneous. Neither Flexman, et al. nor Tanaka, et al. disclose or suggest a process as is found in claim 21 and neither reference discloses or suggests a composite including a tensile bond strength between the polyacetal component and the thermoplastic polyamide elastomer component of at least 0.5 N/mm^2. For at least these reasons, Applicants respectfully request withdrawal of the rejection.

Applicants also respectfully submit that for at least the reasons indicated above relating to the independent claim, the pending dependent claims patentably define over the references cited. However, Applicants also note that the patentability of the dependent claims certainly does not hinge on the patentability of the independent claim. In particular, it is believed that some or all of these claims may possess features that are independently patentable, regardless of the patentability of the independent claim.

It is believed that the present application is in complete condition for allowance and favorable action, therefore, is respectfully requested. The Examiner is invited and encouraged to telephone the undersigned, however, should any issues remain after consideration of this Amendment.

Please charge any fees required by this Amendment to Deposit Account No. 04-1403.

Respectfully submitted,

DORITY & MANNING, P.A.

Christina L. Mangelsen
Registration No. 50,244

P.O. Box 1449
Greenville, SC 29602-1449
Phone: (864) 271-1592
Facsimile: (864) 233-7342

Date: 12/17/10